

South Dakota nothing could be done on the great dam, and it was with the greatest difficulty that any work could be kept open.

The forest supervisor of the San Isabel forest reserve in Colorado reports that snow fell almost continuously from December 1 to January 3. Logging, examination of claims, etc., were interfered with. The supervisor of the Arapaho forest states that for a period of over a week during the middle of the month the temperature fell each morning to -38° to -48° while the lowest registered was -60° . The supervisor of the Las Animas National Forest at La Veta, Colo., states that the total snowfall at the upper ranches near the Spanish Peaks and the upper Cucharas is now 78 inches. Considerable of this has drifted into the canyons where it is freezing and getting solid. The heavy snowfall accompanied by an occasional wind has caused all roads, trails, and even the open fields to be impassible for all travel, except snow shoes, on at least two-thirds of the forest. The cutting of timber either under free use permit or sale has been entirely stopped on account of the severe weather conditions.

The Horticulturalist of the Experiment Station at the University of Missouri, Prof. J. C. Whitten, has sent the following very important letter regarding the possible damage to fruit buds because of the severe weather in December following the unusually mild and wet November:

We have been making a very careful examination of the buds on our experiment station grounds since this cold spell, and I am glad to report that thus far they remain practically uninjured. Of course, our peach trees set many times as large a number of fruit buds as are needed for a full crop of fruit. In any weather, no matter how favorable, some percentage of these fruit buds will be killed or weeded out by weather conditions.

The last observation which we made, January 4, showed that not more than 5 per cent of the fruit buds of hardy varieties have been killed this winter, and only 15 per cent of the tenderest varieties, like Alberta, have been killed. This is a smaller percentage of fruit buds than are usually killed up to this time, even in our most favorable winters. I would have to say then that at the present writing there has been less injury to fruit buds of all kinds on our experiment station grounds this winter than has ever before been the case at this time of year during the 15 winters that I have been at Columbia.

THE UNITED STATES WEATHER BUREAU IN THE WORK OF THE ENGINEER.

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The engineer engaged in works for the improvement of the navigation of streams, the control of floods, or the drainage of lands is always deeply interested in precipitation records as reflected in the stage of streams, the run-off of a given watershed, or low temperatures which may result in ice.

In planning construction work of any kind within the high

water banks of a stream, the engineer speculates on the probable date when the stage of the river will be such as to enable actual work to begin and how long a season of suitable stage he may reasonably expect. He must also reckon with the temperature conditions which produce ice, the probable duration thereof, and the months between November and March, when it is most liable to occur.

In dredging for the maintenance of low water channels the engineer gives consideration to the stages of the contributing tributaries in order that he may approximate the time when actual work should begin; and near the end of the low water season he studies the increase in stage and causes thereof in order to determine whether or not higher stage conditions are to be permanent. The date of the return of the dredges to winter quarters depend on this decision.

In the construction of levees for flood control study is given to the probable crest of a coming flood from the time it starts at the headwaters of the tributary streams, and the work is shaped as far as practicable so that the new embankment may not be overtapped and seriously damaged.

Before the drainage engineer can reach an intelligent conclusion as to the size of ditches required in a given district he must study carefully all available records as to rainfall and run-off in the area to be drained.

The irrigation engineer in the same way arrives at the amount of water which he can probably store for use during the dry season.

Railway engineers must know areas of watersheds, the maximum rainfall, and run-off in order to determine the size of culverts required to safely pass flood volumes.

The city engineer must be acquainted with similar facts in order to design sewers that will be of sufficient size to carry off surface drainage due to rainfall.

So it will be seen that the observations of the Weather Bureau touch the work in all branches of engineering, and reliable records of rainfall and temperature are of great value to the engineer.

It is important that such records be continued and that the number of stations be increased so that more rainfall measurements would be available for use in predicting stages in the streams of the minor basins.

It would also be well if attention could be given to run-off, especially in cases of rainfall of unusual magnitude.

The field of work occupied by the United States Weather Bureau is of great importance and value to the engineer, and as such it has won the confidence of the profession at large and is entitled to the assistance and support thereof.

